OPTICAL MONITORING OF GAMMA-RAY LOUD BLAZARS

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The observations by the *Compton Gamma Ray Observatory* (CGRO) have shown that highly variable and radio-loud quasars emit a significant fraction of their energy in the γ band. According to the Inverse Compton model, the γ-ray emission is due to upscattering of soft (IR-optical-UV) photons by high energy particles. Optical monitoring is thus of great value in providing information on the mechanisms that rule the production of the seed photons for the γ-ray radiation and on the γ-ray emission itself. In particular, detection of variability correlations between optical and γ-ray emissions would be a crucial test for the theoretical predictions.

For the above reasons, we have started an optical monitoring campaign of γ-ray loud blazars in Torino (Italy) since November 1994 (Villata *et al.*, 1995). Our list includes 30 objects. In order to have a better temporal coverage, we entered collaborations with other monitoring groups on some sources [e.g. Massaro *et al.* (1995) on 0422+004; Ghisellini *et al.* (1995) and Latini *et al.* (these proceedings) on 0716+714; Sillanpää *et al.* (1995) and Takalo *et al.* (these proceedings) on 0851+202, as part of the OJ-94 Project, where we are involved also for 0219+428 and 0235+164]. Data have been taken with the Torino 1.05 m R.E.O.S.C. telescope equipped with a 1242 × 1152 pixels CCD camera and standard Johnson UBV and Cousins RI filters. Observations have been done in the R and B bands.

Most of the sources show noticeable optical variations on both long and short time scales, and for some of them we could detect also intranight

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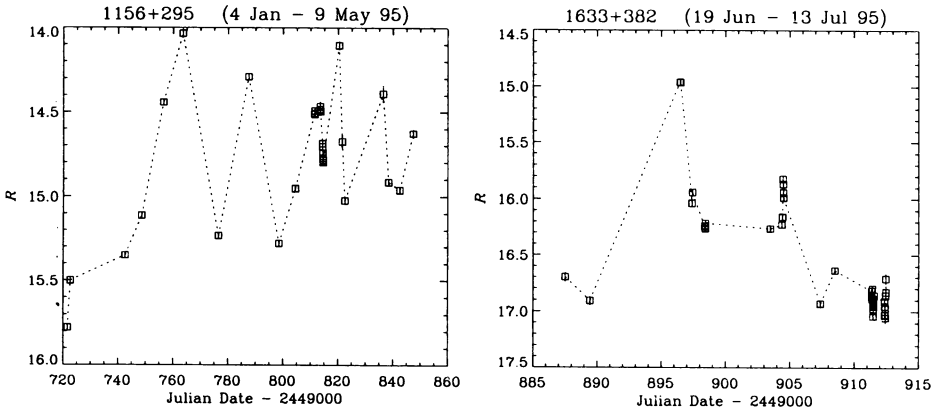

Figure 1. Light curves in the R band for the two quasars 1156+295 and 1633+382

variability.

Figure 1 shows part of the light curves in the R band for 1156+295 and 1633+382. The source magnitude is given as the average value between the magnitudes obtained with respect to two of the three reference stars that we chose in the source field. The optical emission of the highly polarized quasar 1156+295 (4C 29.45) has been rapidly and widely changing during all our monitoring period ($\Delta R_{\max} = 1.75, \Delta B_{\max} = 1.81$), with the steepest decrease of about 0.9 mag (R) in two days (JD $\sim$ 2449821); a peak was detected at JD = 2449836, during the CGRO observation period (18 Apr – 2 May 95), when a very high γ-ray emission (maybe one order of magnitude greater than the previous detection of $6.3\,10^{-7}\,\mathrm{cm}^{-2}\,\mathrm{s}^{-1}$ in 1991) was registered. Consistent intranight variability has been found for the quasar 1633+382 (4C 38.41); on JD = 2449904 a variation $\Delta R = 0.34$ mag was detected in half an hour. After a period of quiet emission, this source reached its historical maximum ($R = 14.96 \pm 0.03$) on June 27, 1995 (Bosio *et al.*, 1995); observations in the radio band are strongly encouraged, since a time-delayed correlated peak could be detected.

References

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